

Applic. No. : 09/761,594

In the Claims:

Claim 1 (currently amended). A semiconductor device in chip format, comprising:

a chip;

electrical connection pads disposed on said chip;

at least one first insulating layer disposed on said chip such that said electrical connection pads are free of said first insulating layer on at least one surface;

interconnects running on said first insulating layer and in each case lead from said electrical connection pads to base regions;

a second insulating layer disposed on said interconnects and on said first insulating layer, said second insulating layer having a thickness, said second insulating layer having openings formed therein leading to said base regions;

a conductive material with an elasticity, introduced into each of said openings;

small balls disposed on said conductive material in a region of a free end of each of said openings, said small balls having an elasticity and being metallic at least on an outside; and

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said thickness of said second insulating layer, said elasticity of said conductive material, and said elasticity of said small balls ~~resulting in~~ being selected for obtaining a desired level of mechanical decoupling from a printed circuit board upon the semiconductor component being soldered onto the printed circuit board.

Claim 2 (original). The semiconductor device according to claim 1, wherein said second insulating layer is at least four times thicker than said first insulating layer.

Claim 3 (currently amended). A method for producing semiconductor devices in a chip format, which comprises:

providing chips;

placing electrical connection pads on the chips;

applying at least one first insulating layer to at least one surface of the chips such that the electrical connection pads are left at least partially uncovered by the first insulating layer;

producing interconnects on the at least one first insulating layer, the interconnects leading to base regions of external connection elements;

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applying a second insulating layer on the interconnects and on the at least one first insulating layer, the second insulating layer having a thickness;

forming openings in the second insulating layer above the base regions and leading to the base regions;

introducing a conductive material with an elasticity into the openings;

placing small balls onto the conductive material in a region of a free end of each of the openings, said small balls having an elasticity and being metallic at least on an outside; and

selecting the thickness of said second insulating layer, the elasticity of the conductive material, and the elasticity of the small balls to obtain a desired level of mechanical decoupling from a printed circuit board upon the semiconductor component being soldered onto the printed circuit board.

Claim 4 (previously presented). The method according to claim 3, which comprises using a doctor blade for introducing the conductive material into the openings.

Claim 5 (previously presented). The method according to claim 19, which comprises

forming the chips on a wafer; and

after the curing of the conductive adhesive, dividing the wafer to obtain the semiconductor devices.

Claims 6-10 (canceled).

Claim 11 (withdrawn). The method according to claim 18, which comprises:

forming the chips on a wafer; and

after the remelting of the solder paste, dividing the wafer to obtain the semiconductor devices.

Claim 12 (withdrawn). The semiconductor device according to claim 1, wherein said conductive material is a solder paste which has been remelted after introduction into said opening.

Claim 13 (previously presented). The semiconductor device according to claim 1, wherein said conductive material is a conductive adhesive which has been cured after introduction into said opening.

Claim 14 (previously presented). The semiconductor device according to claim 13, wherein said small balls are composed completely of metal.

Claim 15 (previously presented). The semiconductor device according to claim 1, wherein said small balls are metallized plastic balls.

Claim 16 (previously presented). The semiconductor device according to claim 1, wherein said conductive material has a cylinder shape in said openings.

Claim 17 (previously presented). The semiconductor device according to claim 1, wherein said second insulating layer is thicker than said first insulating layer.

Claim 18 (withdrawn). The method according to claim 3, wherein the conductive material introduced into the opening is a solder paste which has been remelted after introduction into said opening.

Claim 19 (previously presented). The method according to claim 3, wherein the conductive material introduced into the opening is a conductive adhesive which has been cured after introduction into the opening.

Claim 20 (previously presented). The method according to claim 19, wherein the small balls disposed on the conductive adhesive are composed completely of metal.